Flexible & Customizable Platform for Power Secondary System
Smart Grid Demands

- Efficiency & Effectiveness
  - Shorten the construction period
  - Improve the efficiency of O&M
  - Reduce maintenance cost
- Integration & Intelligence
  - Miniaturization and integrated devices
  - Locally installable device
  - Smarter device
Total Solution
Integrated Platform & Device Platform

- Device Platform
  - Flexible, Scalable, Expandable

Substation Area Prot. Line Prot. (Backup) Busbar Differential Prot. Acceleration

Multi-function Device
- Line Prot.
- Measure & Control
- Metering

On-site Protection
- Line Prot.
- Merging Unit
- Smart Terminal
Total Solution
Integrated Platform & Device Platform

- Integrated Platform
- Standardization, Prefabrication, Modulization
Total Solution
Integrated Platform & Device Platform

- Integrated Platform
- Standardization, Prefabrication, Modulization
Integrated Platform

Carbine based device delivery

Prefabricated IEDs

Field assembling

Integrated Platform

Standardization

Customization

Prefabrication

Installability
Integrated Platform Standardization
Integrated Platform Standardization

- Standard carbine is $6200 \times 2800 \times 3133$ (length $\times$ width $\times$ height, unit: mm)
- Customizable on demand.
Integrated Platform Customization

- Rack mounting structure
- Customizable function zone

Monitoring Zone

Protection Zone
Integrated Platform Customization

- Customizable carbinе material (steel, GRC, fiberglass)
Integrated Platform Prefabrication
Integrated Platform
Installability
Integrated Platform Installability

Delivery type substation construction, shorten construction period, lessen footprint.

Standard interface between primary and secondary, plug & play.

Integrated and optimized design, lower total cost.

Improve the overall effectiveness of smart substation construction.
Integrated Platform
Installability

- Prefabricated external connection cables
Integrated Platform Summary

Integrated platform significantly improved smart substation building efficiency.

- Shortened construction period
- Reduced building area
- Improved construction quality
Device Platform

High Performance

Advanced Intelligence

Extraordinary Reliability

Flexible

Open

Smart

Reliability

Traceability
Device Platform
Flexible

Horizontal Integration
- Substation Area Protection
- Multi-function Secondary Device
- Integrated Metering and control Device
- ...

Vertical Integration
- Locally Installed Device
- Multi-in-one Device
- ...

Distribution
- Distributed Bus Differential Protection Device
- Distributed Transformer Protection Device
- ...

© ABB
November 17, 2016 | Slide 17
Device Platform
Flexible—High performance Flexible backplane Bus

HFB based scalable multi-processing architecture

Features:
1) Peer nodes only
2) No Time slice
3) Scalable Bandwidth
4) Lossless Arbitration
5) Priority Rotation

Features:
1) Peer nodes only
2) No Time slice
3) Scalable Bandwidth
4) Lossless Arbitration
5) Priority Rotation

……

HFB

I O I O C C C C P U C P U H M I

Distributed Arch.
Redundant Arch.
Mixed Arch.
Device Platform
Flexible—Automatic Application Distribution

Automatic function distribution, scalable processing system number, highly scalable processing architecture.

Substation Area Protection

Automatic Static Configuration

Processing System

Processing System

Backplane
Device Platform
Open—Graphical Tool chain
Device Platform
Open—Application Simulation

No physical device & tester required, easy debugging, improved efficiency

Simulation Environment

Panel Process  HMI Process

LCD and LED  Inner Communication

Key Info

PSS Process  PSS Process

Virtual Device

Virtual Instrument

61850 MMS Client
Device Platform
Smart

Equipment intelligent analysis
• Multidimensional Sensing
• Workable life online estimation
• Hardware Self test and condition monitoring

Reduce O & M and learning costs
• Adaptive software and hardware
• Plug and play
• Unified tooling, GUI and maintenance method

Seamless upgrade and replacement
• Unified hardware architecture
• Standard hardware and software interface
Device Platform
Reliability

**Component**
- Preferred suppliers and components
- Double Sources
- Destructive Physical Analysis
- Manufacturability and purchasability assessment
- Test case library for key components

**Design**
- Failure model effectiveness analysis
- Derating use
- PI and SI
- Thermal simulation
- EMS & EMI design
- Common build block
- Code review

**Test**
- Black box test
- White box test
- Exceeds standard by 10% to 20% in type test
- HALT

**Manufacture**
- NPI
- ICT
- Automatic manufacture testing chain: AIO、X-ray、PCBA ICT、PCBA FCT、IED FCT、IED burn-in
Device Platform
Traceability
Device Platform
Traceability—Maintenance
Device Platform Summary

- Improved product reliability in various ways
- Adapted for integration trend of secondary devices
- Optimized for compact and locally installed devices
- Enhanced intelligence for efficient operation and maintenance
Summary

Economic Benefits

- Shorten construction period by 50%, reduce floor space by 25%, 30% reduction in the number of IDEs.
- IED development cycle shorten by 20%, project implementation and maintenance efficiency improved by 15%, total cost reduced by 15%.

Social Benefits

- Achieve efficient and green substation construction. Improve industrial construction benefits, promote industrial technology progress.
- Leading upstream and downstream industrial chain development.
Power and productivity for a better world™